

[0115] However, in embodiments of the present disclosure, when the driver steps on the brake pedal 40 while the vehicle is being rotated, the vehicle should be stopped.

[0116] To this end, in the rotation control operation, when the brake pedal 40 is stepped in while the vehicle is being rotated, the rotation speed of the vehicle is reduced.

[0117] That is, when the driver steps on the brake pedal 40 while the vehicle is being rotated, since the driver would stop the vehicle by allowing a danger inside or outside the vehicle to be recognized, when a signal of the brake pedal 40 is applied, the vehicle is decelerated.

[0118] FIG. 9 is a flowchart illustrating an overall process of controlling an in-situ rotation mode of the four-wheel independent steering type vehicle according to embodiments of the present disclosure.

[0119] To describe with reference to the drawing, when the driver operates the gear shift lever or the gear shift button to select the in-situ rotation mode, whether an absolute value of the steering angle exceeds β (about two degrees) is determined (S10).

[0120] Thus, when the absolute value of the steering angle exceeds β , each of the front and rear wheels is steered and rotated by as much as an angle of 45° using the corner modules 60a, 60b, 60c, and 60d (S20).

[0121] Then, whether the step rotation mode button 17 is selected is determined (S30).

[0122] As the determination result in operation S30, when the step rotation mode button 17 is selected, a steering angle is detected and then a target rotation angle is set according to a steering angle range.

[0123] For example, when three step rotations are set in units of an angle of 30° , whether an absolute value of the steering angle exceeds 90° is determined (S31), and when the absolute value of the steering angle exceeds 90° , a target rotation angle α is set to 90° (S32).

[0124] Otherwise, when the absolute value of the steering angle does not exceed 90° , whether the absolute value of the steering angle exceeds 60° is determined (S33), and when the absolute value of the steering angle exceeds 60° , the target rotation angle α is set to 60° (S34).

[0125] In addition, when the absolute value of the steering angle does not exceed 60° , whether the absolute value of the steering angle exceeds 30° is determined (S35), and when the absolute value of the steering angle exceeds 30° , the target rotation angle α is set to 30° (S36).

[0126] However, as the determination result in operation S30, when the step rotation mode button 17 is not selected, the steering angle is detected and then the target rotation angle is set to correspond to the steering angle.

[0127] That is, when the absolute value of the steering angle is 100° , the target rotation angle α is set to 100° (S37).

[0128] Subsequently, whether a signal of the accelerator pedal 30 is turned on is determined (S40), and when the signal of the accelerator pedal 30 is turned on, whether the steering angle exceeds 0° is determined (S50), and then a rotation direction of the steering wheel 20 is determined.

[0129] For example, when the steering angle exceeds 0° , it is determined as a situation in which the steering wheel 20 is turned to a right side, and the driving part 70 for rotating the vehicle is rotated in a forward direction to rotate the vehicle in-situ in the clockwise direction (S51).

[0130] Otherwise, when the steering angle does not exceed 0° , it is determined as a situation in which the steering wheel 20 is turned to a left side, and the driving part

70 for rotating the vehicle is rotated in a reverse direction to rotate the vehicle in-situ in the counterclockwise direction (S52).

[0131] Subsequently, whether a signal of the brake pedal 40 is turned on is determined (S60), and when the signal of the brake pedal 40 is not turned on, it is determined whether an absolute value of the rotation angle of the vehicle coincides with a previously set target rotation angle to determine whether an in-situ rotation is achieved by as much as an intent of the driver (S70).

[0132] In addition, whether a vehicle speed of the in-situ rotation is zero is determined (S80), and when the vehicle speed of the in-situ rotation is zero, control is terminated.

[0133] In addition, as the determination result in operation S60, even when the signal of the brake pedal 40 is applied, the process proceeds to operation S80 to determine whether the vehicle speed of the in-situ rotation is zero, and when the vehicle speed of the in-situ rotation is zero, the control is terminated.

[0134] As described above, according to embodiments of the present disclosure, the target rotation angle is set by as much as the steering amount by which the driver operates the steering wheel 20, and the vehicle is rotated in-situ by as much as the set target rotation angle so that the rotation angle of the vehicle is accurately controlled, and the driver easily and conveniently operates the in-situ rotation function of the vehicle to reduce driving anxiety and prevent an incorrect operation of the steering wheel 20 due to dizziness during the rotation so that the accident risk may be reduced.

[0135] In accordance with embodiments of the present disclosure, a target rotation angle is set by as much as a steering amount by which a driver operates a steering wheel, and a vehicle is rotated in-situ by as much as the set target rotation angle so that a rotation angle of the vehicle can be accurately controlled, and the driver can easily and conveniently operate an in-situ rotation function of the vehicle to reduce driving anxiety and prevent an incorrect operation of the steering wheel due to dizziness during the rotation so that the accident risk can be reduced.

[0136] Meanwhile, although the present disclosure has been described in detail with respect to only the above described specific examples, it is obvious to those skilled in the art that various modifications and alterations are possible within the technical scope of the present disclosure, and it is natural that such modifications and alterations fall within the appended claims.

What is claimed is:

1. A control method of an in-situ rotation mode of a four-wheel independent steering type vehicle, the control method comprising:

performing a wheel rotation operation for rotating a wheel according to the in-situ rotation mode when the in-situ rotation mode of the vehicle is executed;

performing a target rotation angle calculation operation for calculating a target rotation angle of the vehicle based on a steering angle of a steering wheel when the steering wheel is steered; and

performing a rotation control operation for controlling the vehicle to be rotated in-situ by as much as the target rotation angle when a step-in signal of an accelerator pedal is applied.

2. The control method of claim 1, wherein, in the target rotation angle calculation operation, the target rotation angle